Department of Energy
Richland Operations Office
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Richland, Washington 99352

FEB 0 2 1995

Mr. Russell Jim
Confederated Tribes and Bands
of the Yakama Indian Nation
P.O. Box 151
Toppenish, Washington 98948

Dear Mr. Jim:

COMMENTS ON HANFORD SITE RISK ASSESSMENT METHODOLOGY (HSRAM), REVISION 3.0

Thank you for your comments on the draft of Revision 3.0 of the HSRAM. 39342 42855
Specific responses to your comments are attached. We would appreciate your assistance in identifying exposure scenarios and specific ingestion rates of foodstuffs for Native American people.

Some of your comments reflect cultural and natural resource concerns which cannot be properly addressed in the forum of the risk assessment (RA) process. These concerns would be better addressed in the context of cultural resources and natural resource trustee in the decision process. RAs are only one of the many inputs to the remediation decision process.

The HSRAM was originally developed to document Hanford-specific elements of human and ecological risk assessment in order to comply with Hanford Federal Facility Agreement and Consent Order Milestone 29. The intent was to develop and document a consistent methodology to comply with current regulations and guidance to be used in the Environmental Restoration Project. The first version of the methodology known as the, "Hanford Site Baseline Risk Assessment Methodology," was essentially a site adaptation of the U.S. Environmental Protection Agency's (EPA) RA Guidance for Superfund. 39342
HSRAM, Revision 3.0, is the third revision of what was intended to be a living document. The major change included in this revision is the addition of procedures for ecological RA as outlined in EPA's, "Framework for Ecological Risk Assessment."

Should you have any question concerning RA methodology for the Environmental Restoration Project or follow-up information to determine exposure scenarios or ingestion rates of foodstuffs, please call Mr. Alden J. Foote on (509) 376-7172.

Sincerely,

John D. Wagoner
Manager

EOD:AJF

Attachment

cc w/attach:
G. Emison, EPA
T. Grumbly, EM-1
The Honorable Jay Inslee
The Honorable Mike Lowry
The Honorable Patty Murray
D. Sherwood, EPA
M. Riveland, Ecology

RESPONSES TO COMMENTS BY THE CONFEDERATED TRIBES AND BANDS OF THE YAKAMA INDIAN NATION ON HANFORD SITE RISK ASSESSMENT METHODOLOGY REVISION 3, REVIEW DRAFT

November 30, 1994

Received from: Russell Jim, Manager, Environmental Restoration/Waste Management Program, Yakama Indian Nation

RJ1. The scope of the subject assessment properly includes the risk associated with human health and the risk to biological species occupying or potentially occupying contaminated areas now or in the future. However, risks to physical conditions at Hanford associated with religious and or cultural practices and beliefs are not addressed. The risks to these values should be properly assessed and alternative actions for remediation weighed (based on the risk assessment) to avoid or minimize risk to the maintenance or establishment of pertinent physical conditions.

For example, in the Yakama Nation ER/WM letter of October 12, 1994, we addressed concerns with the use of a sheet metal piling barrier to accomplish remediation of ground water at the N-springs location, because of the disruption of ancestral burial grounds and disturbance of bodies. We noted that the use of minimally disruptive technology, for example, freeze barrier technology, should be utilized at that location to accomplish ground water remediation.

The subject risk assessment should provide methods for assessing the risk to ancestral burial grounds and to assure consideration of minimally disruptive remediation technologies. In addition, the technology for minimizing mechanical and chemical degradation of grave sites and bodies shall be implemented. This requirement should be incorporated in the appropriate system engineering requirement documents.

We are available to participate in the development of the appropriate scenarios and metrics associated with the cultural/religious values to be considered.

Comment Resolution: Risks to physical conditions at Hanford associated with religious or cultural practices and beliefs, potentially associated with remedial alternatives, are addressed through processes other than HSRAM. Evaluation of potential impacts to cultural or religious sites from remedial alternatives should be addressed during cultural resource survey activities.

RJ2. The risk assessment does not consider the effects on mutagenic rates of chemical and radiological exposure on human and animal germ cells to contaminants. In particular, the effects of organic-bound tritium and carbon-14 should be assessed and the risk of mutations, modifying future generations, estimated. Of particular concern is the mutagenic effect on humans of consumption of groundwater contaminated with tritium and the consumption of foods containing tritiated proteins, grown with tritiated irrigation water. In addition, mutations in fish consuming tritiated water and food during the generation of germ cells is a related ecological concern.

Comment Resolution: Mutagenic effects associated with potential chemical or radiological exposures, including tritium and carbon-14 are addressed in HSRAM. Human health risks associated with mutagenic effects are evaluated in HSRAM in terms of increased cancer risks. For radionuclides and most chemical contaminants, carcinogenicity is a more sensitive indicator of mutagenic effects than effects to germ cells. For those chemicals where mutagenic effects to germ cells are of higher concern, such as teratogenicity (i.e. birth defects) or developmental defects, toxicity factors specifically for these effects are used to assess human health risks. The methods used in HSRAM to assess human health risks are consistent with U.S. Environmental Protection Agency guidelines for risk assessments.

RJ3. The estimation of risk of lost use of natural resources associated with remediation actions should be made part of the subject methodology. Considering the need to address the wholeness of the natural resources in any remediation effort, risk evaluations involving human health should necessarily be closely coordinated with natural resource residual injury/remediation evaluations. Thus, the subject risk assessment methodology should be submitted to the Hanford natural resource trustees established by CERCLA for approval.

Comment Resolution: Risks to natural resources potentially associated with remedial alternatives are not addressed in HSRAM, but are addressed in RERA. RERA is being transmitted to the Indian Tribes, the EPA, Washington Department of Ecology, and the natural resource trustees for their review and comment.

RJ4. Risk models developed previously for Hanford have failed to scientifically address the unique hazardous chemical and radioactive exposure pathways to Native Americans. In addition, such models must account for the unique risk factors from exposure to toxic materials which are specific to Native Americans. Risk methodology, databases, quality assurance information, and models must be made available to the Yakama Nation government during the entire risk evaluation process. Such a "transparent" process is necessary for independent review by the Yakama government, and is necessary to establish credibility for any risk estimates.

Comment Resolution: Risk models addressing exposure pathways unique to a Native American population are being developed in studies independent of the Hanford Site and will be incorporated into application of the risk assessment methodology as they become available. As an example, an October 7, 1994, U.S. EPA press release described the first part of a survey by the Columbia River Inter-Tribal Fish Commission which found the average estimated consumption rate for the four Native American Tribes in the Columbia River Basin to be approximately nine times higher than the consumption estimate for the general population. The survey estimates that, on average, tribal members consume 58.7 grams of fish per day per individual while the estimate for the general population is 6.5 grams per day.

The EPA Office of Water is to convene a task force to conduct a second phase of the study to examine contamination levels in fish consumed by tribal members. The study's findings of high rates of average consumption among the Tribes (over 50 grams per day per individual) and the highest rates of consumption (over 250 grams per day per individual) have raised sufficient concerns to warrant development of the second phase of the study.

RJ5. Fish farming is an activity that occurs commonly throughout the United States. In many instances ground water is used in such farming activities. Scenarios evaluating potential

health effects that consider the acceptability of ground water should include the pathway of exposure via the consumption of agricultural fish raised on contaminated ground water. Such farming and/or hatching operations may become more prevalent in the future as natural surface water resources decline through use of contamination. Since fish can concentrate certain contaminants, this food pathway may be more limiting than the consumption of contaminated ground water by people. Such a scenario is comparable to the scenarios that consider use of ground by cattle and the accumulation of radioisotopes in milk or meat.

Comment Resolution: Commercial production of foodstuffs, including fish farming, is subject to sufficient regulation to make this suggested pathway of exposure to ground water contaminants very unlikely to occur. Future land uses suggested for the Hanford Site in public forums do not include release of lands for commercial or public use which would knowingly allow access to levels of contamination which would pose a danger to any individual.

RJ6. The consumption of fish and consideration of this scenario reflects the attention to foods characteristically favored by Indian people. In this regard, consumption rates of fish for Indian people is about an order of magnitude greater than that specified in the subject methodology. Appropriate assumptions regarding the quantity of consumption of food stuffs, including the consumption of fish by Indian people should be specified in the subject methodology.

Comment Resolution: The resolution to comment RJ4 discusses an October 7, 1994, U.S. EPA press release describing the first part of a survey by the Columbia River Inter-Tribal Fish Commission which found the average estimated consumption rate for the four Native American Tribes in the Columbia River Basin to be approximately nine times higher than the consumption estimate for the general population. The survey estimates that, on average, tribal members consume 58.7 grams of fish per day per individual while the estimate for the general population is 6.5 grams per day.